



CROSSTALK

A Publication of the TRW Amateur Radio Club

February, 1991



Mir Space Station on Packet

AMSAT NEWS SERVICE BULLETIN 040.03 FROM
AMSAT HQ
SILVER SPRING, MD FEBRUARY 9, 1991

Packet radio activity has been a part of Amateur Radio space communications for almost a decade. More recently, packet radio was on the U.S. space shuttle STS-35 mission. Now comes word packet radio is a permanent part of the Soviet manned space station, Mir, callsign U2MIR.

CLUB CALENDAR

- Every Monday
DCS Net on 145.32 Repeater 7:30 PM
- Every Wednesday:
Emergency Communications Team Net on
145.32 Repeater 12:30 PM
- Every Friday:
Club Breakfast in Bldg S Cafeteria 7:00 - 8:00 AM
- February 12th:
Emergency Communications Team Meeting
R3 Emergency Operations Center (EOC) Noon
- February 23rd:
TRW/ARC Swapmeet
Aviation and Marine 7:30 - 11:30 AM
- February 26th:
Club Meeting E2/1200 Noon
- March 5th:
Executive Board Meeting Upper Crust Pizza,
Inglewood and Manhattan Beach Blvd. 5:00 PM
- March 12th:
Emergency Communications Team Meeting
R3 Emergency Operations Center (EOC) Noon
- March 15th:
St. Patrick's Day Party
Shakey's Pizza, Torrance 5:00 PM
Talk-In on 145.32 Repeater
- March 26th:
Club Meeting E2/1200 Noon

According to the Soviet coordinator, Boris Stepanov, UW3AX, the new packet equipment was launched to Mir on a Progress M6 re-supply "space truck" January 14. It is thought the docking with Mir took place two days later. Initial reports of packet activity from Mir were made on Sunday, January 20 according to Courtney Duncan, N5BF.

UW3AX says the packet equipment now on Mir consists of a PacComm Handi Packet unit and ICOM IC-228A 2 meter FM transceiver together with a laptop computer. Veteran Cosmonaut Musa Manarov, UV3AM, familiarized himself with the equipment at the Cosmonaut training facility at Star City near Moscow prior to his launch to orbit late last year. Both PacComm and ICOM America have donated several equipment sets to facilitate the Mir packet activity.

Although the IC-228A can run as much as 25 watts rf output power, UW3AX suggests Musa will probably keep the power levels below maximum. ICOM America marketing manager Evelyn Garrison, WS7A, met UW3AX in Seattle at the GoodWill Games last summer and endorsed the Mir packet donation.

The PacComm Handi Packet TNC on Mir has a built-in Personal Message System that has been using the address U2MIR-1. According to PacComm president Gwyn Reedy, W1BEL, the software on the flight unit is off-the-shelf. Some new software with features tailored for the space environment may be sent to Mir soon. Meanwhile, some configuration changes to the existing unit such as allowing for up to 10 simultaneous connects will be made by U2MIR command shortly. Other changes to increase QSO/QSL-ability will also be phased in says Gwyn.

Some confusion arose when the current packet equipment was put into action by Musa on January 20. Recent reports of an Austrian packet experiment, AREMIR, said that unit would not be launched in the near future. So some were taken by surprise when packet activity began anyway. Few knew about the "other" packet activity in the works. The current Mir packet activity had been quietly arranged over the prior several months. Its commencement had been unheralded.

The downlink frequency is 145.55 MHz. Some consideration is being given to using split frequency operation to improve operation.

[ANS thanks WA2LQQ for this bulletin.]

ELECTION RESULTS - SEE PAGE 3

Notes from the Editor

Welcome to the February, 1991 edition of the Crosstalk. I want to say a thank you to all the club members who have complemented me on the look and content of our little newsletter. It's easy to put a paper together when such great contributions roll in month after month. Keep 'em coming! To those of you who haven't yet seen your article in print, fear not. As space permits, I'll publish it. (Gosh...it's nice to have a backlog!).

Last Months Goof's Department: Apologies to our Membership Chairman Gary Vennie, KG6JP, who's last name was misspelled on the back page. I've corrected it this month, Gary (I think!).

I've been collecting Desert Storm information on packet BBS's lately and have included some interesting stuff in this issue of Crosstalk. You might want to check out the Short Wave listings from Rick De Fiore, N6KIB, for some interesting listening frequencies. By the way (or BTW as they say in computer BBS circles) Rick puts out a nice newsletter for the SWL/scanner listener called The LA Monitor. Rick works and can be reached at Jun's Radio in Culver City.

Congratulations to local Hams who made two-way packet contacts with WA4SIR aboard the Space Shuttle Columbia during mission STS-35. The complete list can be found in the March issue of 73 Magazine and includes luminaries such as N6JLS, N6KN, KJ6AW, NK6K, N6ZAY, N6RVC, N6ZND, N6MEL and WA2KDL.

The next Ham in Space mission will be STS-37 currently scheduled to launch in early April when the shuttle Atlantis will deploy the TRW-built Gamma Ray Observatory (GRO). Amateur Radio activity will be high since all five astronauts are Hams. The TRW/ARC will have a Special Event Station on the air during the five day mission to commemorate the deployment of the GRO spacecraft.

If you want to help out with this project, contact Don Renkowitz, W6SQF, who will be coordinating GRO/SES activities for W6TRW.

Don't forget the annual TRW Amateur Radio Club St. Patrick's Day Bash at Shakey's Pizza in Torrance after work on March 15th. (I forgot the exact QTH but I'm sure directions will be available on the 145.32 repeater).

The Middle East war affects all of us, especially those with friends or relatives on the front lines. Many of you know Frank Cartier, WA6RAY, who manages our Swapmeet each month. His son, Frank Jr., KB6LSE, joined the Marines a while back and is now part of Operation Desert Storm. I've had lots of fun playing Ham Radio with both Frank's over the years.

Another good friend, Bill Dews, K6AWO, suggested that I print Frank Jr.'s address so that folks here at home may write to him. I've been sending Crosstalk's to him recently but I'm sure he'd appreciate some words from the guys and gals at Space Park. Drop him a line at:

F.R. Cartier USMC
553856255
2nd BN 3rd MAR
FPO SFO, CA 96602-8942

Congratulations to our new slate of officers! Looks like it'll be another great year for the club. Interest is at a high with lots of folks showing up for club meetings and EBM's. If you've been on the sidelines, now's the time to get involved. Contact Jeff Shields, N9CZA, to volunteer. This is your club and you are needed.

CU on the radio.
de N6CIZ

Jim Wike, W6GPE Injured in Accident

On Wednesday, February 6th, long time TRW Amateur Radio Club member Jim Wike, W6GPE, was critically injured when he was struck by a car while walking across Hawthorne Blvd near his home in Palos Verdes.

Jim was on his way to work when the accident occurred just hours after attending the TRW/ARC Executive Board Meeting in his newly elected position as club Secretary.

Jim suffered severe head and internal injuries which have left him in the intensive care ward of Harbor General Hospital. At last report, his condition seems to be improving but, at best, he faces surgery and a long recovery period.

Blood donors are requested to help with needed transfusions. Donors should report to the third floor of the hospital and state that they are donating blood for Jim Wike.

Our prayers and best wishes for a full recovery go out to Jim, his wife Luella, and his family.

1991 Election Results

Club Officer elections were held in January and the results are in. Reelected for President was Jeff Shields, N9CZA, who now starts his second year at the helm.

The other officers are: Dave Williams, KF6IB, elected Vice President, Jim Wike, W6GPE, Secretary, and Chris Wachs, WA2KDL, elected Treasurer.

Calvin Hashi, N6SSW, collected the ballots and announced that all officers were elected by unanimous vote of the ballots received as of January 25th.

Congratulations to the new slate of officers.

1991 Novice Class

The club plans to offer a Novice Class again this fall. I'd like to express my appreciation to those who helped last year. We need more help this year, however, to put on equipment demos and help teach the class since I may be out of town more often.

We also need suggestions for a classroom location outside TRW (preferably free). In 1990 we had six non-TRW employees who required escort and we were limited on demos since radio equipment is difficult to bring in and out of TRW buildings.

Please contact Bill Shanney, x31108
(or 213-542-9899 evenings) if you can help.

Crosstalk Subscriptions Available for \$5.00 per Year

Once again, the TRW/SEA (the organization we are chartered under at Space Park) has restricted the number of "outside" members our club can accept.

If you work at TRW or retired from TRW, no problem. Simply contact the Membership Chairman for an application. However, if you are not associated with TRW, but still want to stay in touch, the club is offering a one year subscription to Crosstalk for only \$5.00.

If you want to be assured of receiving the newsletter each and every month, send your name, address and \$5.00 to the Crosstalk Editor at the address listed on the back page.

From the Librarian / QSL Manager...

Jerry Dean, WA6GVO

QSL Cards are now available! These cards depict the AXAF (Advanced X-ray Astrophysics Facility), which is scheduled for a mid-1990's shuttle launch. Cards are suitable for over-printing with your own call.

Please bring a dollar to the next meeting for 100 of these beauties or send your request to the Club address, c/o QSL Manager.

Please do not ask for more than 100 cards.

Desert Storm Packet Traffic Procedures

There have been several Bulletins concerning message traffic to military members involved in the Desert Storm operation. A lot of conflicting information has been distributed. This Bulletin is intended to clarify some of the issues discussed as they relate to traffic being handled by this station.

K6IYK is also Army MARS station AAR9WG and operates the Southern California Army MARS Packet MailBox System. Traffic for Desert Storm destinations with complete military addresses including the APO ZIP can be sent to this station as formal NTS traffic and will be refiled into the MARS system for immediate forwarding to Military Station active in Europe and the Middle East. Delivery times are not guaranteed but reports have been received of deliveries taking less than 36 hours.

Packet BBS Systems in SOCAL automatically route NTS traffic to 09* ZIPs directly to K6IYK MailBox. In addition, WF6O, the SWD NTS Packet Coordinator, directs Desert Storm messages to this MailBox when they have been mis-directed. No special action is required to route these messages and the normal ST <ZIP> command can be used at any WESTNET MailBox.

Be sure to include the following in the NTS message address:

RANK AND NAME OF INDIVIDUAL
SERVICE NUMBER (SSN)
COMPLETE UNIT NAME/DESIGNATOR
APO NUMBER

There are no specific limits to message size but multiple messages are suggested if word count exceeds 35. Delivery Service messages are not available for MARS traffic.

Please contact this operator if you have further questions.

-73- -Jim K6IYK @ K6IYK.#SOCA:CA

Wanted

Vibroplex Blue Racer or Speed-X bug in very good to excellent condition. I will also consider a Martin Junior or Zephyr if they are in good condition. Please call Bill Shanney, KJ6GR @ 213-542-9899 evenings after 6PM.

MIDDLE EAST RADIO STATIONS...UPDATE 01/25/91

LISTENING TIPS: Most of these stations are fairly low power but audible here in the states. Use of headphones are a must. Also ECSS receiving methods are advised (use USB or LSB and zero-beat).

ISRAEL Kol Israel

"The Voice of Israel" English Service
 0000 - 0030 UTC 7465, 9435, 11605 kHz
 0100 - 0130 UTC 7465, 9435, 11605 kHz
 0200 - 0230 UTC 7465, 9435, 11605 kHz
 0500 - 0515 UTC 7465, 9435, 11605 kHz (7410, 17575 kHz)
 1100 - 1130 UTC 11585, 17575, 17590, 21790 kHz
 1815 - 1830 UTC 11585, 11655 kHz
 2000 - 2030 UTC 7465, 9435, 11605, 17630 kHz
 2230 - 2300 UTC 7465, 9435, 11605, 11655, 17575 kHz

NOTE: As of 1/24/91 Kol Israel has moved most frequencies down 1.5 kHz due to heavy jamming.

SAUDI ARABIA

"This is the Broadcasting Service of the Kingdom of Saudi Arabia" English Service
 1600 - 2100 UTC 9705, 9720 kHz

TURKEY

"The Voice of Turkey" English Service
 0355 - 0500 UTC 9445, 17760 kHz
 1330 - 1400 UTC 17785 kHz
 2100 - 2200 UTC 9795 kHz
 2300 - 2400 UTC 9445, 9665, 9685, 17760 kHz

UNITED ARAB EMIRATES

"This is United Emirates Radio in Duba" English Service
 0330 - 0400 UTC 11945, 13675, 15400, 15435 kHz
 0530 - 0600 UTC 15325, 15435, 17830 kHz
 1030 - 1110 UTC 15435, 21605, 21675 kHz
 1330 - 1400 UTC 15320, 15400, 15435, 21605 kHz
 1600 - 1640 UTC 15320, 15400, 15435, 21605 kHz

LEBANON

"This is the Voice of Lebanon" English Service
 0900 UTC 5977.5, 6549, 6215 kHz
 1315 UTC 5977.5, 6549, 6215 kHz
 1815 UTC 5977.5, 6549, 6215 kHz

IRAN

"This is Tehran the Voice of the Islamic Republic of Iran" English Service
 1130 - 1225 UTC 9575, 9705, 11715, 11790 kHz
 1400 - 1500 UTC 7220 kHz
 1930 - 2030 UTC 6035, 9022 kHz

IRAQ Radio Baghdad

"This is Radio Baghdad" English Service
 0230 - 0430 UTC 11810, 11830 kHz
 1700 - 1900 UTC 6055, 11860, 21675 kHz
 2100 - 2300 UTC 11860, 13660 kHz

JORDAN Jordan Radio

"This is Radio Jordan Broadcasting from Amman" English Service
 1200 - 1415 UTC 13655 kHz
 1420 - 1739 UTC 9560 kHz

QATAR Qatar Broadcasting Service

"This is the Qatar Broadcasting Service from Doha" English Service
 0245 - 0700 UTC 15285, 15395 kHz
 0700 - 1300 UTC 21535 kHz
 1300 - 1700 UTC 21555 kHz
 1700 - 2130 UTC 17800 kHz

British Forces Broadcasting Service - BFBS
 No times given: 7125, 9640, 13743, 15205, 17695, 21735 kHz

"Baghdad Betty"
 1000 - 1200 UTC 11680 kHz
 1600 - 1800 UTC 11680 kHz
 2000 - 2200 UTC 11680 kHz

Thanks to Rick Di Fiore N6KIB for putting this list together.

Scott KD6CQ

MARS in the Middle East

The following appears in the February 1991 issue of QST:

In response to a request from US Army Brigadier General Wesley B. Taylor Jr., community commander of the Nuernberg (Germany) Military Community, the ARRL has shipped two HF radios for MARS use by the First Armored Division in Saudi Arabia. "Our present MARS equipment is insufficient for a deployment of this kind," Taylor said, "and we are desperately in need of additional equipment."

The rigs, a Kenwood TS-140S and an ICOM IC-735, were donated by the manufacturers in September of 1989 for use in Puerto Rico following Hurricane Hugo. MARS traffic from the Middle East can be heard on 20.994, 19.532, 14.650, and 14.665 MHz.

MCI Communications Corporation has announced it is providing equipment "to establish 15 new MARS stations" in Saudi Arabia. Since September, MCI has been donating free emergency long-distance telephone service to US troops in Saudi Arabia through the American Red Cross.

Since the time of that article, many additions have been made to the MARS stations in Saudi Arabia. TenTec donated many HF stations for the smaller MARS stations. Harris/RF Communications, a major supplier of Mil type HF radios, has given the MARS gateway station in Saudi a special hi-speed data system. The Ten-Tec has helped the movement of in-country traffic while the Harris gear provides a direct Saudi to USA network for record traffic (MARSgrams).

Harris has also equipped it's ARC's club station, WB2PSI/AAR2CRF, with matching gear. Additionally, a group of Minnesota MARS members have sent several hi-performance phone patch systems to Saudi.

-Jim WA2ZKD @ WB2PSI

FCC RELOCATES 80 METER NOVICE CW BAND

The FCC has amended its rules to relocate Novice and Technician Operator Class control operator frequency privileges in the 80 meter amateur service band from the 50 khz at 3700-3750 khz to the segment at 3675-3725 khz. This rule change will reduce the amount of mutual interference between U.S. amateur and Canadian amateur stations, and provide Novice and Technician Class operators with more opportunities to improve their telegraphy skills.

Commission rules authorize amateur stations with a control holding a Novice or Technician Class operators license to transmit telegraphy in the 80mtr Novice segment. This segment is designed so that beginning amateur radiotelegraphers can gain actual experience in sending and receiving telegraphy messages.

In Canada, however, frequencies in the upper half of the 80 mtr Novice segment are used by amateurs for telephony transmission, thus creating the potential for interference when a U.S. station transmits telegraphy on the same channel and at the same time as the Canadian station. Relocation of the 80mtr Novice segment to 3675-3725 khz provides a solution to the mutual interference problem.

The Commission, however, declined to adopt a proposal by the ARRL to expand the 80mtr Novice segment by 25khz. Rather than less interference to stations, the Commission said that the likelihood existed for more interference. They would have to share with a large number of U.S. stations running much higher power.

[Commission action January 4, 1991, in PR Docket 90-100. The Jan. 10th FCC press release did not indicate the effective date of the Report and Order.]

Edited for pkt by Jim Anderson KG7BC

University Club Seeks Ham Gear

The Loyola Marymount University Amateur Radio Club is currently in the process of establishing a 6M repeater/remote base system for Los Angeles area hams. Due to a limited budget, we can not afford new gear. We seek your help in obtaining reliable TX and RX equipment in establishing our remote base system.

If you have any old RCA or Motorola or the like transmitting equipment that can be tuned to the 52 MHz band and are willing to donate it to the LMUARC, please contact me! Also, if you do not have any equipment you can spare us, but do have detailed plans on building such gear (maybe a simple repeater controller?) we would also appreciate hearing from you.

If you can help, please contact me: N6UGD @ N6YN
or landline: (213) 338-7356.

Many thanks for your consideration. 73.

John N6UGD @ N6YN
Loyola Marymount University
Westchester, CA 90045

ANNOUNCING

1991 WEST COAST VHF CONFERENCE

May 3, 4, 5

at the Holiday Inn on the Beach, Ventura, California

450 East Harbor Boulevard • Ventura, CA 93001



- TECHNICAL TALKS • "FUN" TALKS • VENDOR EXHIBITS
- NOISE FIGURE MEASUREMENTS • ANTENNA GAIN "CONTESTS"
- BANQUET SATURDAY • BREAKFAST SUNDAY, "TOP-OF-THE-HARBOR" RESTAURANT
- SANTA MARIA-STYLE BARBECUE, SUNDAY AFTERNOON • SWAP MEET
- NAME-BRAND PRIZES, GIFTS, AWARDS (specific attendance prizes at all meals)
- CONFERENCE PROCEEDINGS (WRITTEN TRANSCRIPT OF TALKS) AVAILABLE
- "SPOUSE" NO-CODE TECHNICIAN LICENSE CLASS

Registration Friday night, Social Hour, State of VHF forum, no host bar and hors d'oeuvres
Saturday: talks, lunch on your own, banquet with exciting keynote speaker, ARRL Forum, Noise Figure
Sunday: breakfast overlooking Ventura Harbor, Antenna Gain, Santa Maria BBQ, Special Events

Hotel boasts the Pacific Ocean and beach, heated swimming pool, FREE PARKING, exercise room, game room, laundry, free HBO, gift shop, within walking distance of Ventura's "Antique Row"

SPECIAL WEST COAST VHF CONFERENCE RATE (be sure to mention the conference)

\$55 per night, double occupancy (plus room tax of \$5.50)

call 1-800-842-0800

make reservations early, as rooms may not be available

EVENT		COST	QTY	TOTAL	
Registration	before 3-1-91	\$11	x	___	=___
	after 3-15-91	\$16	x	___	=___
	+ spouse	\$1			=___
	other non-ham	\$3	x	___	=___
	under 18, free		x	___	=___
Proceedings		\$7	x	___	=___ (\$12 after convention)
Banquet (buffet-style)		\$27	x	___	=___
Breakfast		\$11	x	___	=___
Santa Maria BBQ		\$23	x	___	=___
GRAND TOTAL				=___	(check to West Coast VHF Conference)

NAME _____ CALL _____
ADDRESS _____
CITY _____ ST _____ ZIP _____
TELEPHONE _____

Mail to: West Coast VHF Conference (805-482-0320)
PO Box 178
Somis, CA 93066-0178

NO-CODE TECHNICIAN WEEKEND CLASS - Offered by Loraine McCarthy, N6CIO. Bring a spouse or a friend to become a Ham while you attend the Conference. Class fee of \$95.00 includes materials. Testing will take place at the end of the class. Lots of equipment demonstrations, fun, and learning will take place in the classroom. Preregistration and prestudy are necessary. Contact Loraine at (714) 979-2633 for details and registration flyer. **SIGN UP TODAY!**

LETTERS TO CROSSTALK:

New Crosstalk

Well, we have a Crosstalk for the new year and the editor did a great job too. How many have called up Rich and thanked him? Did you think for one minute that he has more time on his hands than you do? I have seen a lot of club papers over the years and the Crosstalk stands out far above the rest.

The one thing that I have learned is that the editor must be an active member, not just a card carrying member. He must be involved in the activity of the club i.e Field Day in June, the VHF/UHF contest in June, the picnics in the warm summertime, the club's banquet and of course attending all EBM's - and I mean all - not just dropping by now and then. (How many have you attended in the last year?)

The reason the editor can cover the club's activity is that he is there. And don't forget the swapmeet at the end of the month. Did you help out at any in the past year? Or do you just enjoy the roaming around and buying stuff while the other active member gets up early to show up and get it started.

The swapmeet started in '78 with KE6LB (not his call in '78) and he and a lot of other Hams have put in a lot of good times keeping the whole thing going. This is a real moneymaker for the club and if you can help out please don't wait. Just call/talk to the Swapmeet Chairman and or the Prez of the club.

Anyway, Rich, I want to thank you for the time that you have spent getting the Crosstalk together and seeing that it's out on time. I'm sure that I'm speaking for the other members, too.

Bill Dews, K6AWO

More on ATV

Best wishes to the soon-to-be W6TRW/ATV station. 434.0 MHz is the principle 70 cm ATV frequency used in Southern California; it is used for both simplex and relay station operations.

Due to the numerous FM link transmitters coordinated in the 420 to 430 MHz segment of the band, it is almost impossible to have any kind of decent long distance contact using 426.25 MHz. For operations around Space Park to relay information to the EOC and ECC this frequency is quite adequate and recommended.

Operators of the ATV station in the ECC should not expect to achieve DX contacts as the antennas of the ECC have little elevation and are blocked by higher buildings in three directions. Television is a broadband amplitude modulated UHF signal requiring a much higher signal level to be received clearly when compared to narrowband FM. If you have any questions regarding ATV, please contact me at 812-7808.

Serge Miller, WA6BJV

**CLUB MEETING
FEBRUARY 26TH AT NOON**

The SYSOP SEZ

Greg Martens - N6RRY

Yes... W6TRW/BBS has returned!!!

Remember that modem you picked up at the swapmeet a few months ago? The one that promised to gain you access to that veritable wealth of communications knowledge, expertise, and computerized HAM tools (the W6TRW Bulletin Board System). Yes... I'm talking about that little magical black box that says what looks like "Hayes" or something, under all of that dust.

Well break out the dust rags and fire that baby up! Because as of 1530 hrs local time on the 19th of February, the TRW Amateur Radio Club BBS was back "ON-THE-AIR"! Throughout the last few months, we've been fighting hard disk problems, which subsequently led to the complete loss of the "d:" partition. Unfortunately the "d:" partition was also the location of the BBS on the hard disk. But thanks to the help of Irv/WA6ZOU, Chris/WA2KDL, and Cal/N6SSW, the problems are now a thing of the past.

Now I have reconfigured the system, and set-up a new updated version of the WWIV software. It has a lot of new and improved features, all of which I am fairly impressed. Even the "logical" flow of the "human" interface seems to go smoother, despite the inevitable increase of complexity which would usually accompany the many additional features available to the user.

In the coming weeks you will see improvements happening quite regularly, since we are not even making use of some of the features as of yet. These will be implemented as time permits and I will try to keep everyone informed and educated through regular articles here in the CROSSTALK and through "HELP" files and other informative files/notes on the BBS. I will greatly appreciate ANY suggestions, comments, questions, or criticisms via FEEDBACK, E-MAIL, SUB-BOARD postings or any other mode of communication... for that matter.

In the mean time... get logged back onto the system, start building up a respectable program library, and keep those thoughts and ideas flowing on the sub-board posts.

And expect to be hearing a lot more from me and the TRW ARC BBS !

NEW POSTAGE RATES

NEW POSTAGE - QSL CARD - EFFECTIVE FEB 3

USA	.19
CANADA MEXICO	.30
REST OF WORLD - AIR	.40
REST OF WORLD - SURFACE	.35

NEW POSTAGE - LETTER (SASE) - EFFECTIVE FEB 3

USA	.29
CANADA	.40
MEXICO	.35
REST OF WORLD 1/2 OZ AIR	.50
REST OF WORLD 1 OZ SURF.	.70

TRW AMATEUR RADIO CLUB

OFFICERS

President	Jeff Shields
Vice President	Dave Williams
Secretary	Jim Wike
Treasurer	Chris Wachs

N9CZA	D1/1302	812-5669
KF6IB	04/1680	813-7287
W6GPE	R9/1817	814-5476
WA2KDL	M4/2344	813-1506

STAFF

Activities Manager	Don Renkowitz
Emergency Coordinator	Calvin Hashi
Field Day Chairman	Don Renkowitz
LAACARC Delegate	Jeff Shields
Librarian / QSL Manager	Jerry Dean
Membership Chairman	Gary Vennie
Past President	Rich Sauer
SEA Council Rep	Randy McKechnie
Swapmeet Manager	Frank Cartier
Technical Chairman	Chris Wachs
Training Chairman	Bill Shanney
Trustee	Phil Bergeron
Crosstalk Editor	Rich Sauer

W6SQF	R8/2757	814-5739
N6SSW	M4/2375	813-1359
W6SQF	R8/2757	814-5739
N9CZA	D1/1302	812-5669
WA6GVO	R2/1062	812-0770
KG6JP	R5/2231	813-0882
N6CIZ	R4/1041	813-5869
W6ZWS	R5/2290	813-0762
WA6RAY	R11/2049	812-2293
WA2KDL	M4/2344	813-1506
KJ6GR	R5/B382	813-1108
N6PB	R5/2241	813-0511
N6CIZ	R4/1041	813-5869

W6TRW Computer BBS (24 hours, 2400/1200/300, 8 N 1)
W6TRW Hotline (Club Answering Machine)

812-4970
813-8569



TRW Amateur Radio Club
One Space Park
8/1161
Redondo Beach, CA 90278

FIRST CLASS

Deliver To:

Stan Johnson
W6EKK

S/1869